LITEON®
OPTOELECTRONICS

Photocoupler
Product Data Sheet
LTV-172A

Spec No. :DS70-2019-0237
Effective Date: 12/10/2019
Revision: -

LITE-ON DCC

RELEASE

BNS-OD-FC001/A4

LITE-ON Technology Corp. / Optoelectronics
No.90,Chien 1 Road, Chung Ho, New Taipei City 23585, Taiwan, R.O.C.
Tel: 886-2-2222-6181 Fax: 886-2-2221-1948 / 886-2-2221-0660
http://www.liteon.com/opto

Photocoupler
LTV-172A series

1. DESCRIPTION

The LITEON LTV-172A consists of an aluminum gallium arsenide infrared emitting diode optically coupled to a photo-MOSFET in a SOP4 package, which is suitable for surface mount assembly. The LTV-172A is suitable for the battery management systems which require space savings.

1.1 Features

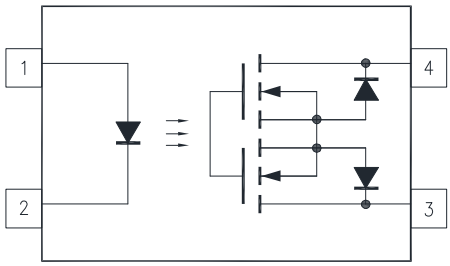
- Normally open (1-form-A)
- Operating temperature range: 110°C(max)
- Trigger LED current: 3 mA (max)
- Isolation voltage: 3750 Vrms (min)
- OFF-state output terminal voltage : 60V (min)
- ON-state current : 500mA (max)
- ON-state resistance : 2Ω (max)
- Halogen free option
- Safety standards

  UL1577

  CUL CA5A

  VDE DIN EN60747-5-5 (VDE 0884-5)

1.2 Functional Diagram



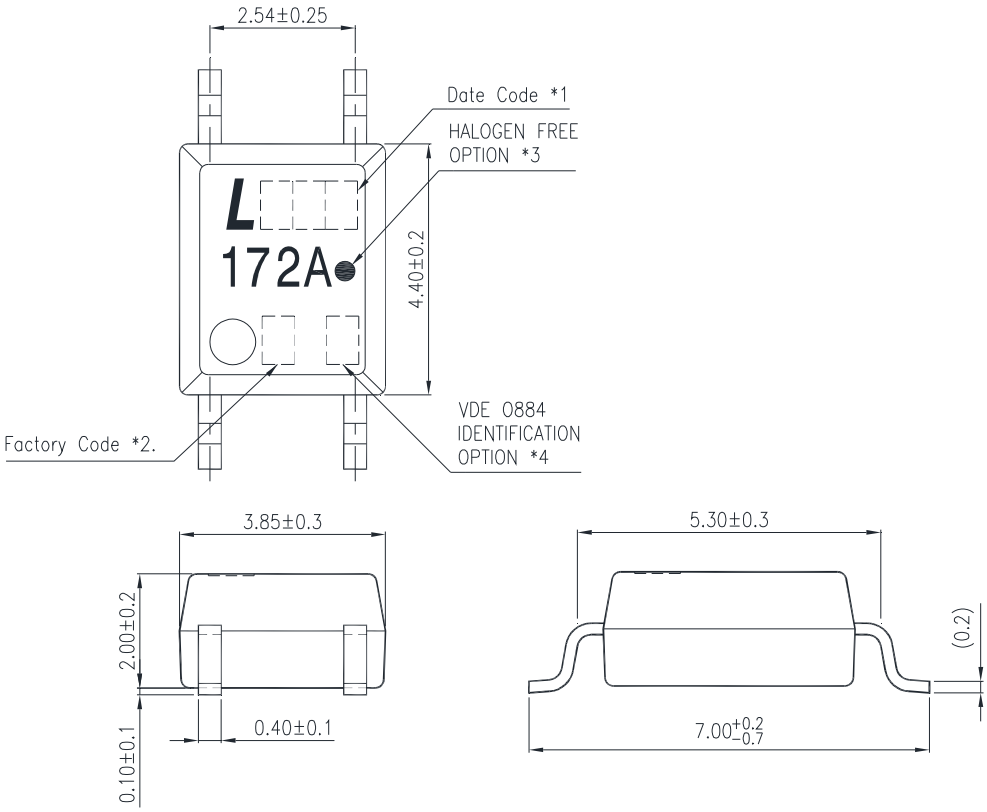
1. Anode
2. Cathode
3. Drain
4. Drain

1.3 Applications

- Battery Management System (BMS)
- Factory Automation (FA)
- Security Systems
- Measuring Instruments
- Smart Meters
- Mechanical relay replacements

2. PACKAGE DIMENSIONS

2.1 LTV-172A series

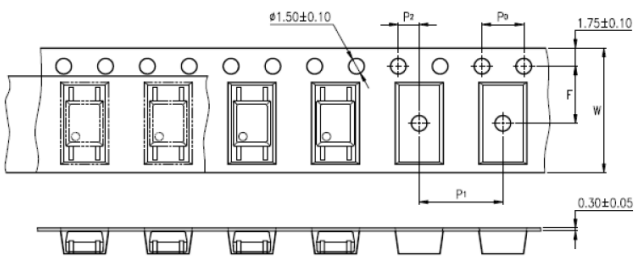


Notes:

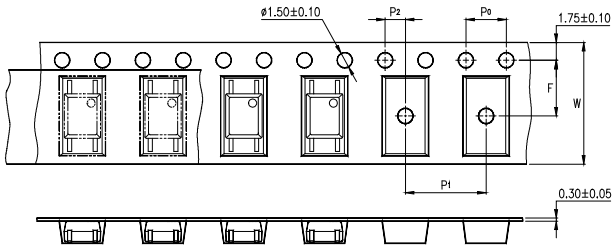
1. 1-digit year code, Example : 2010 = A
   2-digit work week ranging from '01' to '53'
2. Factory identification mark shall be marked (W: China -CZ, X: China -TJ)
3. "●" indicates halogen free option.
4. "4"or"V" for VDE option.

3. TAPING DIMENSIONS

3.1 LTV-172A-TP



3.2 LTV-172A



Description	Symbol	Dimension in mm (inch)
Tape wide	W	12±0.3 (0.472)
Pitch of sprocket holes	P_0	4±0.1 (0.157)
Distance of compartment	F	5.5±0.1 (0.217)
	P_2	2±0.1 (0.079)
Distance of compartment to compartment	P_1	8±0.1 (0.315)

3.3 Quantities Per Reel

Package Type	LTV-172A Series
Quantities (pcs)	3000

4. RATING AND CHARACTERISTICS

4.1 Absolute Maximum Ratings at Ta=25℃

Parameter		Symbol	Rating	Unit
Input	Forward Current	I_F	50	mA
	Forward Currtent Derating ($T_A \geqq 25$ °C)	ΔI_F/°C	-0.5	mA/°C
	Peak Forward Current (100μs pulse, 100pps)	I_{FP}	1	A
	Reverse Voltage	V_R	6	V
	Input Power Dissipation	P_D	70	mW
	Junction Temperature	T_J	125	°C
Output	OFF-State Output Terminal Voltage	V_{OFF}	60	V
	ON-State Current	I_{ON}	500	mA
	ON-State Current Derating ($T_A \geqq 25$ °C)	ΔI_{ON}/°C	-4.95	mA/°C
	ON-State Current (pulsed) (t=100ms, Duty=1/10)	I_{ONP}	1.5	A
	Output Power dissipation	P_O	300	mW
	Isolation Voltage (Note 1.)	V_{iso}	3750	V
	Operating Temperature	T_{opr}	-40 ~ +110	°C
	Storage Temperature	T_{stg}	-55 ~ +125	°C
	Soldering Temperature	T_{sol}	260 (For 10 seconds)	°C

4.2 RECOMMENDED OPERATING CONDITIONS (Note)

Characteristics	Symbol	Min.	Typ.	Max.	Unit
Supply Voltage	V_{DD}	-	-	48	V
Forward Current	I_F	5	7.5	25	mA
On-state Current	I_{ON}	-	-	500	
Operating Temperature	T_{opr}	-20	-	100	°C

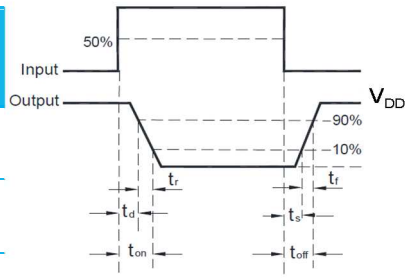
Note : The recommended operating conditions are given as a design guide necessary to obtain the intended performance of the device. Each parameter is an independent value. When creating a system design using this device, the electrical characteristics specified in this datasheet should also be considered.

4.3 ELECTRICAL OPTICAL CHARACTERISTICS at Ta=25℃

Note :

1. AC For 1 Minute, R.H. = 40 ~ 60%. Isolation voltage shall be measured using the following method.
   (1) Short between anode and cathode on the primary side and between collector and emitter on the secondary side.
   (2) The isolation voltage tester with zero-cross circuit shall be used.
   (3) The waveform of applied voltage shall be a sine wave.

2. Turn on / turn off time



				Typ.			on
				1.18			
				-			
Out -put	OFF-State Current	I_{OFF}	-	-	1	μA	V_{OFF}=60V
Coupled	Trigger LED Current	I_{FT}	-	0.8	3	mA	I_{ON}=500mA
	Return LED Current	I_{FC}	0.1	0.6	-	mA	I_{OFF}=100μA
	On Resistance	R_{on}	-	1	2	Ω	I_F=5mA, I_{ON}= 500mA
Transfer characteristics	Turn on time (Note 2.)	T_{on}	-	0.2	2	ms	R_L=200Ω, V_{DD}=20V I_F=5mA
	Turn off time (Note 2.)	T_{off}	-	0.1	0.5	ms	
	Isolation Resistance	R_{iso}	5×10^{10}	-	-	Ω	DC500V, R.H.40 ~ 60%

5. CHARACTERISTICS CURVES

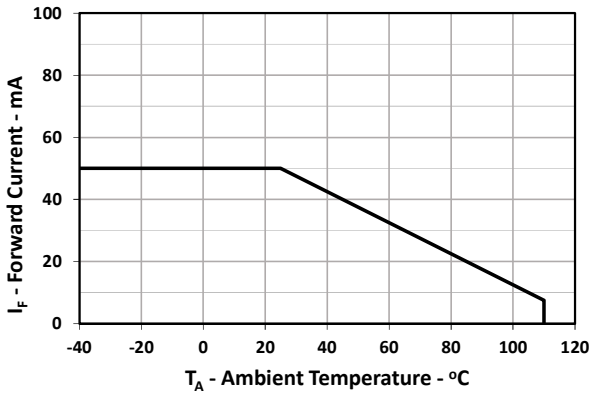


Fig. 1-1 Forward Current vs. Ambient Temperature

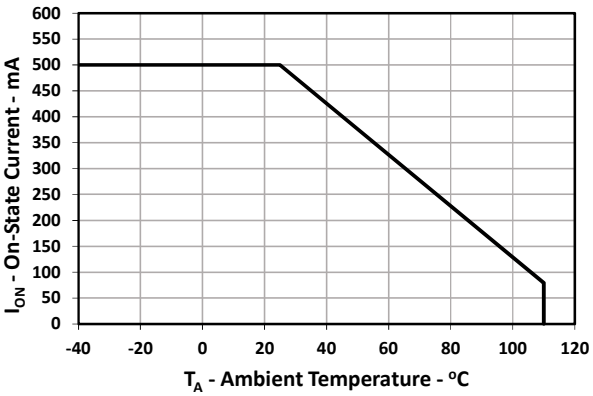


Fig. 1-2 On-State Current vs. Ambient Temperature

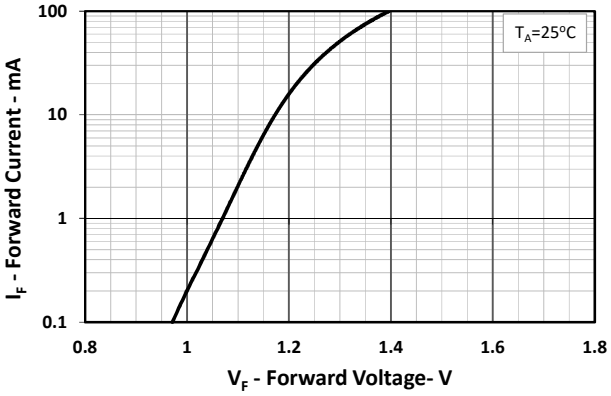


Fig. 2 Forward Current vs. Forward Voltage

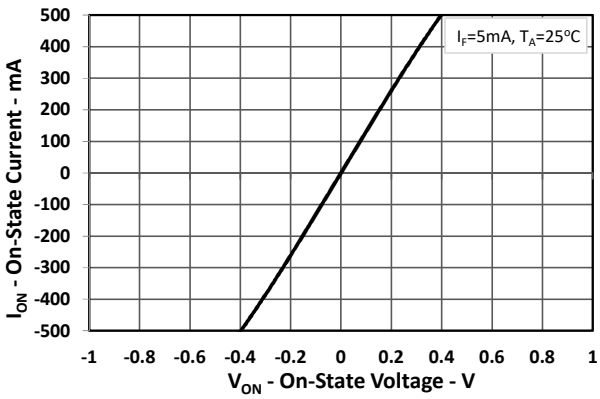


Fig. 3 On-State Current vs. On-State Voltage

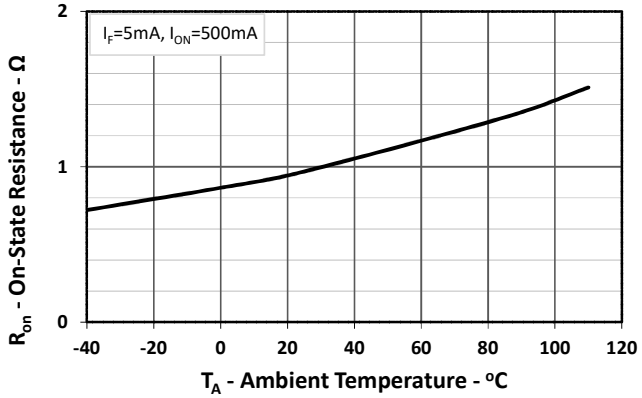


Fig. 4 On-State Resistance vs. Ambient Temperature

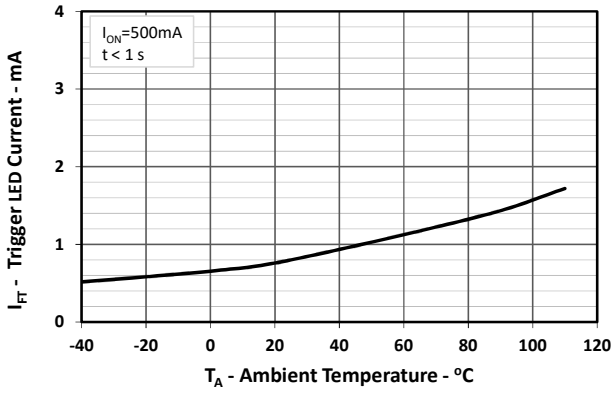


Fig. 5 Trigger LED Current vs. Ambient Temperature

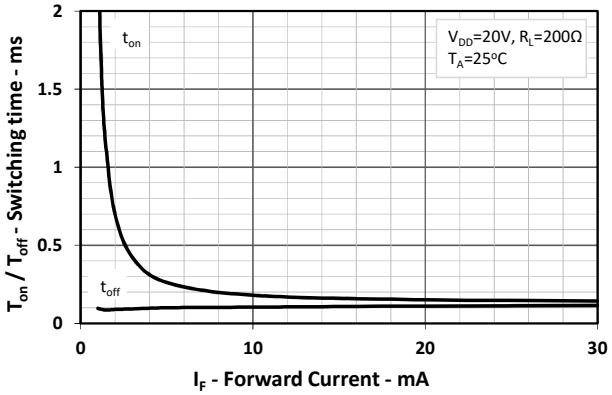


Fig. 6 Switching time vs. Forward Current

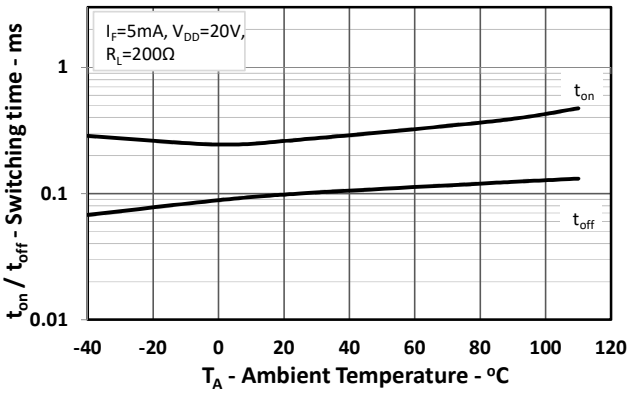


Fig. 7 Switching time vs. Ambient Temperature

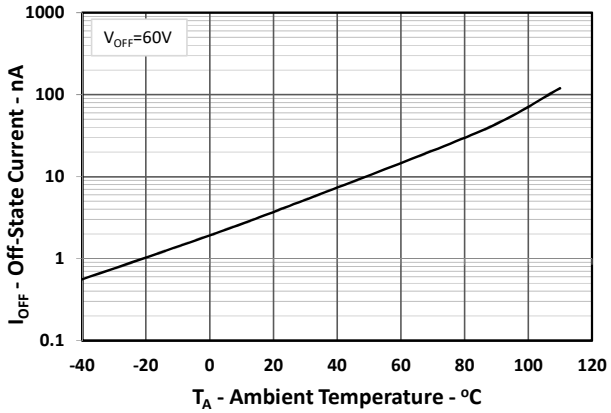


Fig. 8 Off-State Current vs. Ambient Temperature

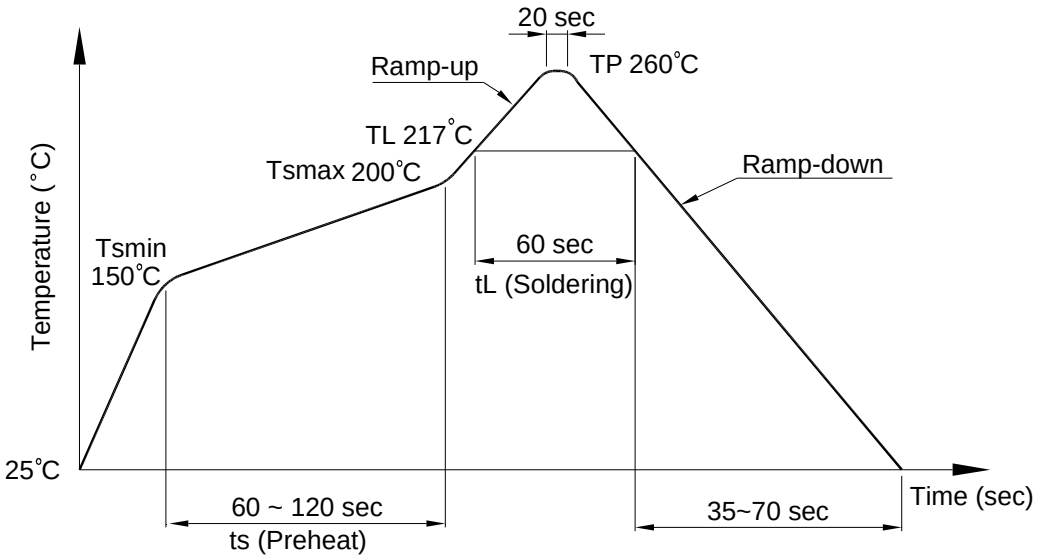
6. TEMPERATURE PROFILE OF SOLDERING

6.1 IR Reflow soldering (JEDEC-STD-020E compliant)

One time soldering reflow is recommended within the condition of temperature and time profile shown below. Do not solder more than twice

.

Profile item	Conditions
Preheat	
- Temperature Min (T_{Smin})	150˚C
- Temperature Max (T_{Smax})	200˚C
- Time (min to max) (ts)	90±30 sec
Soldering zone	
- Temperature (T_L)	217˚C
- Time (t_L)	60 sec
Peak Temperature (T_P)	260˚C
Ramp-up rate	3˚C / sec max.
Ramp-down rate	3~6˚C / sec



6.2 Wave soldering (JEDEC22A111 compliant)

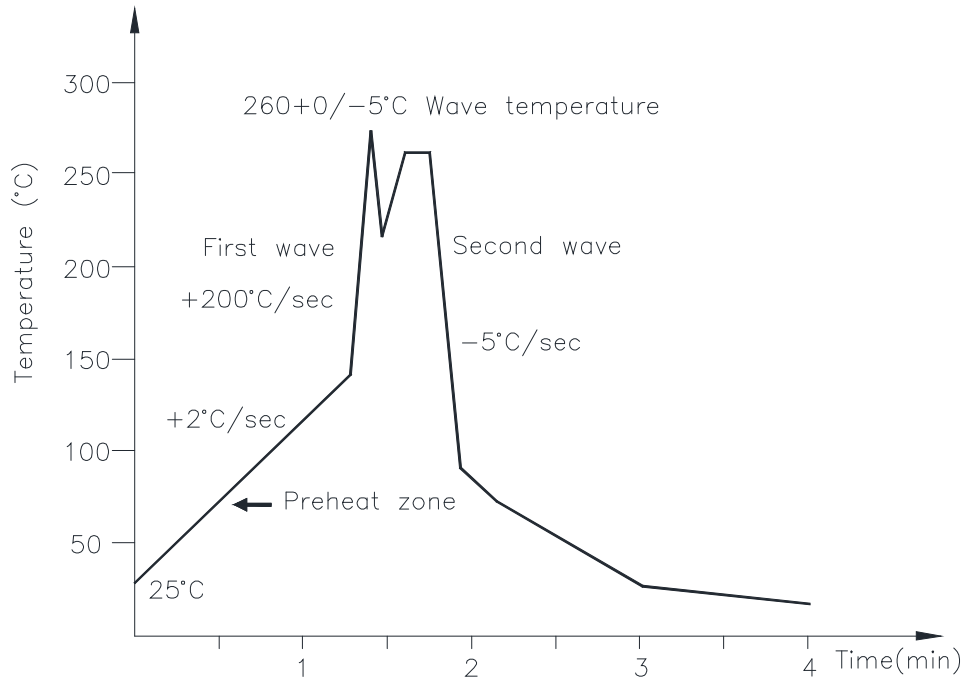
One time soldering is recommended within the condition of temperature.

Temperature: 260+0/-5˚C

Time: 10 sec.

Preheat temperature: 25 to 140˚C

Preheat time: 30 to 80 sec.



6.3 Hand soldering by soldering iron

Allow single lead soldering in every single process. One time soldering is recommended.

Temperature: 380+0/-5˚C

Time: 3 sec max.

7. NAMING RULE

LTV-172A-(1)-G

DEVICE PART NUMBER
(1) TAPING TYPE (TP, no suffix)
LTV-172A has tape and reel solution.
Please refer to orientation of taping on P.3
(2) Halogen free option
Example : LTV-172A-TP-G

LTV172A(1)-V-G

DEVICE PART NUMBER
(1) TAPING TYPE (TP, no suffix)
LTV-172A has tape and reel solution.
Please refer to orientation of taping on P.3
(2) VDE option
(3) Halogen free option
Example : LTV172ATP-V-G

8. NOTES

- LiteOn is continually improving the quality, reliability, function or design and LiteOn reserves the right to make changes without further notices.
- The products shown in this publication are designed for the general use in electronic applications such as office automation equipment, communications devices, audio/visual equipment, electrical application and instrumentation.
- For equipment/devices where high reliability or safety is required, such as space applications, nuclear power control equipment, medical equipment, etc, please contact our sales representatives.
- When requiring a device for any ”specific” application, please contact our sales in advice.
- If there are any questions about the contents of this publication, please contact us at your convenience.
- The contents described herein are subject to change without prior notice.
- Immerge unit’s body in solder paste is not recommended.